Stereocontrolled synthesis of chiral heteroaromatic propellers with small optical bandgaps.

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Streszczenie

Chiral heteroaromatic propellers based on radially π-extended hexapyrrolohexaazacoronenes were obtained in a concise synthesis from suitably functionalized donor–acceptor monopyrroles. To overcome steric hindrance, a new cyclodehydrogenation method was developed, and it uses bromine electrophiles as oxidative coupling agents instead of the commonly employed high-potential oxidants. The new reaction offers high yields of propeller-shaped targets, even for electron-deficient precursors, and shows electrophile-dependent stereoselectivity, with *N*-bromosuccinimide and dibromine yielding, respectively D_6- and C_2-symmetric products. The propeller azacoronenes are chiral and can be separated into configurationally stable enantiomers. In addition to providing steric bulk, peripheral functionalization considerably affects the electronic properties of the propellers, which exhibit reduced optical and electrochemical band gaps, and a more clearly defined electroreduction behavior.

Słowa kluczowe

chrality, chromophores, helicenes, macrocycles, structure elucidation

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